on TROPICOS: names, types, syn. & distr.

THE GENUS MACROCARPAEA (GENTIANACEAE) IN COSTA RICA #000680

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THE GENUS *Macrocarpaea* (Griseb.) Gilg consists of approximately 30 species of shrubby Gentianaceae with a distribution centered in the Andes of northern South America and extending south and east into the Amazon Basin and the mountains of southern Brazil, and north into the Greater Antilles and the mountains of Costa Rica. Three species are now known from Costa Rica. The most common of these, *M. valerii* Standl., is a familiar summer-blooming shrub of the Cordillera de Talamanca and the Cordillera Central. For nearly 70 years, the second species, *M. subcaudata* Ewan, was represented only by the type collection. A modern collection, from another locality, shows that this plant sometimes grows as an epiphyte. Recently, material of a third species has come to light which is described in this paper as *Macrocarpaea acuminata*.

According to Ewan's (1948) treatment of *Macrocarpaea*, the genus consists of two subgenera: PARANAGENES Ewan, with the herbaceous *M. rubra* Malme from southern Brazil as the sole species; and MACROCARPAEA (*Eumacrocarpaea* Ewan) with two sections based primarily on leaf characters, the typical one (Sect. *Magnoliifoliae* Ewan) and Sect. TABACIFOLIAE Ewan. Of the Costa Rican species, *Macrocarpaea subcaudata* belongs to the typical section while *M. valerii* belongs to Sect. TABACIFOLIAE. However, with its short internodes and relatively small but membranaceous leaves, *M. acuminata* appears to be intermediate between the sections.

In many ways, Ewan's infrageneric classification seems unnatural. Recent work by Nilsson (1968, 1970) has shown that three types of pollen are characteristic of the species included in *Macrocarpaea* by Ewan: a distinctive one, having single grains with a coarse reticulum found in subgen. PARANAGENES as well as in the majority of the species in the typical subgenus, including the three from Costa Rica; another single-grain type with verrucoid processes found in three species of sect. TABACIFOLIAE and characteristic of the monotypic Bolivian *Rusbyanthus* Gilg; and a final type, with pollen in tetrads, found in five species of the typical section and characteristic also of *Chelonanthus* (Griseb.) Gilg, another neotropical genus. Although those species with *Rusbyanthus*-type pollen appear to be referable to *Macrocarpaea* on morphological grounds, those with pollen in tetrads do not. These latter species differ from all the others in that their inflorescence consists of a single, terminal, compound dichasium, the divi-

[1] The author wishes to thank Dr. Robert L. Wilbur of Duke University for collecting and preserving flower buds of *Macrocarpaea valerii*, and the curators of the following herbaria for the loan of specimens: DUKE, F, GH, NY, US.

sions of which are not subtended by foliaceous bracts. The proper generic alignment of these species is unclear, although morphologically they appear most closely related to *Chelonanthus*.

A chromosome number for *Macrocarpaea valerii*, $2n = 42$, is reported here for the first time. The standard squash technique was used and the voucher specimen (*Wilbur 14680*) is deposited in the Duke University Herbarium. The only previous report of a chromosome number in the genus was for the Jamaican *M. thamnoides* (Griseb.) Gilg (Weaver, 1969), also $2n = 42$.

KEY TO THE COSTA RICAN SPECIES OF MACROCARPAEA

A. Leaves subcoriaceous, only the midvein and the primary laterals evident; calyx lobes essentially alike and longer than the tube, minutely spiculate. . . *3. M. subcaudata.*

A. Leaves membranaceous, the lesser veins evident, at least below; calyx lobes unequal, shorter than the tube or rarely equalling it, glabrous.

B. Foliage leaves (those not subtending a flowering branch) 7 cm. broad or narrower, more than twice as long as broad; leaves glabrous or rarely the midvein very sparsely spiculate; corolla 4.4–4.7 cm. long; outer calyx lobes obtuse or acutish, the inner ones rounded, as long as broad or narrower; calyx less than 1/3 as long as the corolla tube; stems smooth; lateral flowering branches in 2 or rarely 3 pairs, unbranched or once branched below the dichasia; stalks of the lowermost flowering branches less than 10 cm. long. . . . . *2. M. acuminata.*

B. Foliage leaves more than 9 cm. broad, less than twice as long as broad; foliage leaves and lower floral leaves spiculate on the veins beneath; corolla 3.0–4.0 cm. long; outer calyx lobes rounded, the inner ones truncate or broadly rounded and broader than long; calyx more than 1/3 as long as the corolla tube; stems papillose (under magnification); lateral flowering branches usually in more than 3 pairs, usually 2–3 times branched below the dichasia; stalks of the lowermost flowering branches more than 10 cm. long. . . . . 1. *M. valerii.*

1. **Macrocarpaea valerii** Standley, Publ. Field Mus. Bot. 18: 928. 1938.
TYPE. **Costa Rica**: La Hondura de San José, *Valerio 692* (F!).

Sparsely branched shrubs or subshrubs to 4 m. tall. Stems to 3 cm. in diameter, the internodes hollow with age. Foliage leaves broad-elliptic to suborbicular and obovate, abruptly short-acuminate, attenuate or cuneate-attenuate, 17.5–46 cm. long and 9.5–26 cm. broad, the venation very prominent, the 2 upper pairs of primary lateral veins arching into the tip of the leaf; petioles winged, 1.5–6.5 cm. long; leaves subtending the flowering branches smaller, the lowermost orbicular or broad-elliptic, the uppermost ovate and palminerved. Inflorescences terminal and also axillary from the upper nodes, of long-stalked, branched systems of compound or apparently simple dichasia. Pedicels 5–20 mm. long, strongly recurved in fruit. Calyx campanulate, fleshy, 9–14 mm. long, the lobes hyaline-margined and ciliolate, 3–6 mm. long and 3–7 mm. broad, strongly unequal, the

outer ones ovate, the inner ones transversely elliptic to broadly obovate and auriculate at the base. Corolla greenish-white or pale greenish-yellow, campanulate, somewhat fleshy, the lobes recurved, broadly triangular-ovate to nearly semicircular, obtuse to rounded and often notched, minutely ciliolate, 7–12 mm. long and 5–10 mm. broad, the tube 2.2–2.9 cm. long. Filaments 13–18 mm. long, surpassing the corolla tube or not; anthers 3–5 mm. long. Style 13–16 mm. long; stigma deeply bilobed, the lobes oblong-spathulate, ca. 2 mm. long. Capsules 15–21 mm. long, beaked. CHROMOSOME NUMBER: $2n = 42$.

DISTRIBUTION: from 1000–1800 meters in the mountains of central Costa Rica (MAP 1).

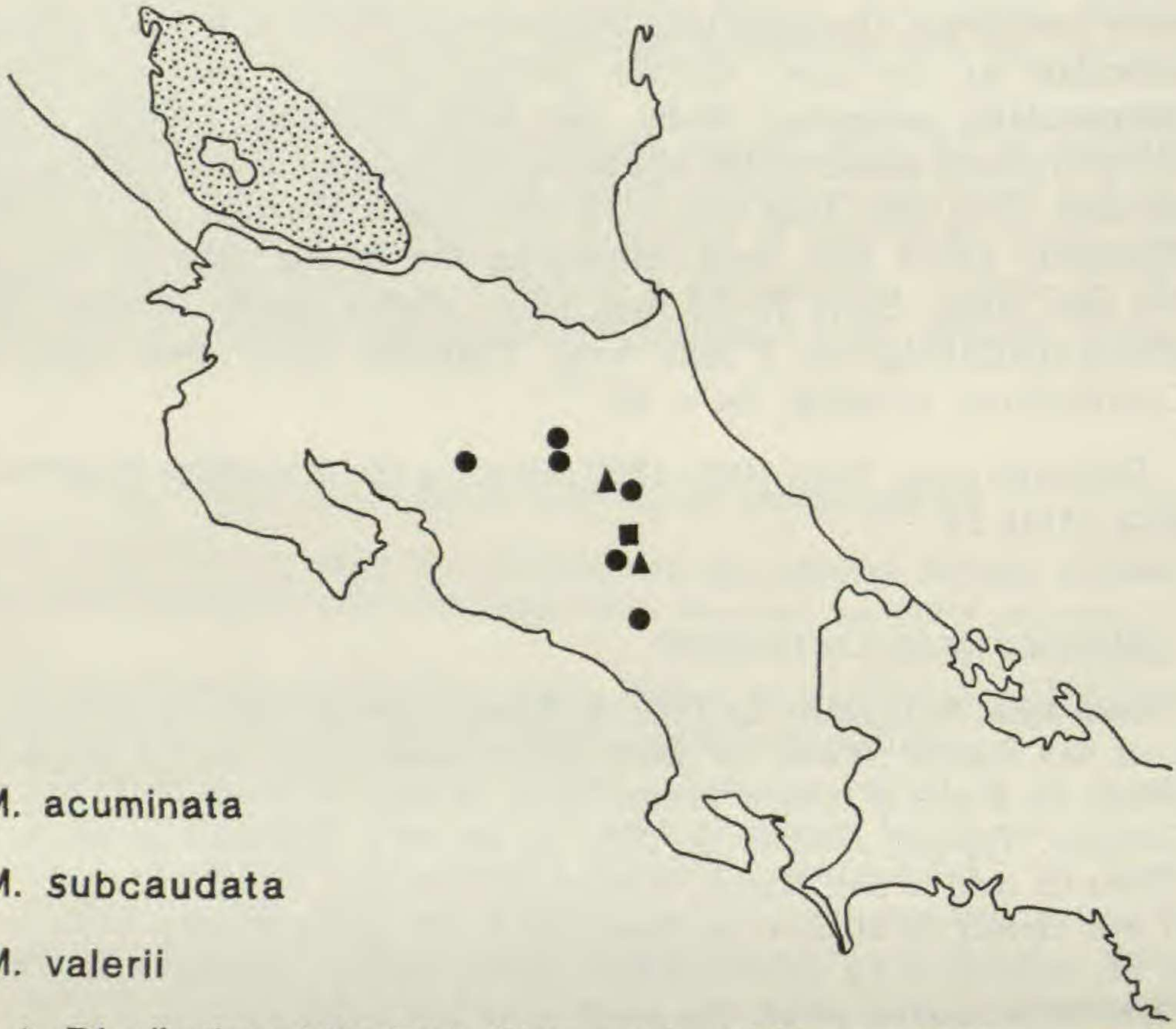
REPRESENTATIVE COLLECTIONS

Costa Rica. ALAJUELA: La Pena de Zarcero, *Smith 1001* (F, GH); ca. 19 km. n. of San Ramón, *Wilbur & Stone 10684* (DUKE, US); ca. 4.5 mi. n. of Vara Blanca on Route 9 toward Puerto Viejo, *Wilbur & Stone 10472* (DUKE, US). CARTAGO: Tapantí, *Jiménez M. 2023* (F, GH, NY). HEREDIA: 1.5 mi. n. of Vara Blanca on road to San Miguel, *Weaver 1405* (DUKE). SAN JOSÉ: ca. 12 km. nne. of San Vicente de Moravia on Route 220 in the saddle between Irazú and Barba in the vicinity of La Palma, *Wilbur 14680* (DUKE); Cordillera de Talamanca, Cerro de la Muerte, 16 mi. (by road) n. of San Isidro General, *Webster, Miller, & Miller 12329* (DUKE); 13 km. al nw. de San Isidro del General, *Jiménez M. 2204* (F).

As noted by Ewan (1948), this is the most common of the Costa Rican species of *Macrocarpaea* and is closely related to the Colombian *M. macrophylla* (HBK.) Gilg. In fact, the two are virtually identical, except that the calyx of *M. valerii* is glabrous, while that of *M. macrophylla* is spiculate.

2. **Macrocarpaea acuminata** Weaver, sp. nov. TYPE. **Costa Rica:** Cartago. Tapantí, *Jiménez M. 2023.* (holotype, F; isotypes, GH, NY).

Frutex, ca. 3 m. altus. Folia membranacea anguste elliptica vel elliptico-oblanceolata, apice acuminata, basi attenuata, margine ± revoluta, nervis ± prominentibus, 7–20 cm. longa et 2.5–7 cm. lata, plus duplo longiora quam latiora, glabra vel raro costa sparsim spiculata; petioli ad 1 cm. longi. Inflorescentiae terminales axillaresque, ramis floriferis lateralibus in 2 vel raro 3 paribus oppositis. Calyx 10–12 mm. longus, lobis inaequalibus 5–7 mm. longis et 4–6 mm. latis, longioribus quam latioribus, lobis exterioribus acutiusculis vel obtusis, lobis interioribus rotundatis. Corolla late infundibuliformis 4.4–4.7 cm. longa, tubo 3.2–3.6 cm. longo, calyce plus triplo longiore, lobis recurvatis triangulari-ovatis obtusis ciliolatis ca. 12 mm. longis et 10 mm. latis. Filamenta 20–25 mm. longa, inclusa vel leviter exserta; antherae ca. 6 mm. longae. Stylus 20–25 mm. longus; stigma



MAP. 1. Distribution of the Costa Rican species of *Macrocarpaea*.

profunde bilobata, lobis ca. 3 mm. longis. Capsula 18–22 mm. longa apice rostrata.

Macrocarpaea acuminata is known only from the type locality, where it grows in close proximity to *M. valerii*. Jiménez, who collected both species at Tapantí (*M. acuminata, Jiménez 2023*; *M. valerii, Jiménez 2022*), has noted on the label that what is here called *M. acuminata* may only represent older specimens of *M. valerii*. The two species are similar and are probably closely related, but they may easily be separated by the characters outlined in the key above.

3. **Macrocarpaea subcaudata** Ewan, Contr. U.S. Natl. Herb. 29: 224. 1948. TYPE. **Costa Rica**: [San José.] La Palma, *Wercklé 16492* (holotype, US!; isotype, NY!).

Low shrubs, sometimes epiphytic. Foliage leaves glabrous, narrow-elliptic to oblanceolate, cuspidate-acuminate, long-attenuate, the margins somewhat revolute, 5.4–11.3 cm. long and 1.2–3.0 cm. broad; petioles to 1.5 cm. long. Inflorescences terminal or also axillary from the uppermost node, few-flowered, of long stalked groups of apparently simple dichasia (the dichasia sometimes reduced to single flowers). Pedicels to 7 mm. long or flowers subsessile. Calyx campanulate, minutely spiculate (rather dense in the type collection) or rarely glabrescent, 7–10 mm. long, fused for 1/4–

1/3 its length; calyx lobes essentially alike, ovate to oblong, obtuse or rounded, ciliolate, longer than broad, 5–7 mm. long and 3–4 mm. broad. Corolla cream-colored or somewhat greenish, narrowly campanulate, 3.2–3.4 cm. long, the tube 2.4–2.6 cm. long, the lobes somewhat recurved, triangular-ovate, rounded to obtuse, minutely ciliolate, 8–10 mm. long and 6–8 mm. broad. Stamens inserted at about the middle of the corolla tube, the filaments 17–20 mm. long, slightly surpassing the corolla tube; anthers 3–4 mm. long. Style 15–18 mm. long; stigma deeply bilobed, the lobes oblong-elliptic, ca. 3 mm. long. Capsule unknown.

DISTRIBUTION: at ca. 1500 meters in the mountains east of San José, Costa Rica (MAP 1).

SPECIMENS EXAMINED

Costa Rica. CARTAGO: Rio Grande de Orosí, 8 km. s. of Tapantí, *Lent 934* (F, NY).

Two species of *Macrocarpaea* are now known to be at least partially epiphytic, *M. subcaudata* and *M. browallioides* (Ewan) Robyns & Nilsson from the mountains of central Panama. Unlike the recent collection by Lent, the type collection of *M. subcaudata* bears no notation as to whether or not it was growing epiphytically.

Ewan (1948) considered the closest relatives of *Macrocarpaea subcaudata* to be *M. cerronis* Ewan and *M. salicifolia* from the Guiana Highlands. These species, however, are among those with pollen in tetrads, and, as mentioned earlier, should be excluded from *Macrocarpaea*. Rather, *M. subcaudata* is probably related to *M. acuminata* and to certain of the West Indian species such as *M. pinetorum* Alain and *M. domingensis* Urban & Ekman.

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